In the rejection, it was noted that the method as applied to any substrate is held prima facie obvious on the basis that it is well known in the art (not including metathesis catalysis) to provide catalyst at a substrate surface, and that EP 833 provides sufficient evidence to provide a reasonable expectation that the reaction would be catalyzed. Applicants point out there is no teaching, suggestion or expectation of the surprising results when treating a metal substrate with metathesis catalyst and contacting this surface with metathesizable material beyond merely catalyzing the reaction. The evidence presented shows a substantial and unexpected improvement in the adhesion of the metathesis polymer formed when the polymer is synthesized from the surface of the metal substrate, rather than within the bulk of the metathesizable material, and this provides enhanced usefulness for protective coatings on metal substrates.

Applicants' evidence of surprising and substantial improvement in adhesion in comparison to premixing catalyst with metathesizable material is a patentable distinction.

Data in the specification also show a variety of metals are significantly adhered to. Examples 27-31 show similar improvement in adhesion to such substrates as stainless steel, aluminum. The support shown is believed commensurate with the scope of the claims presented.

Miscellaneous

Examiner is authorized to charge deposit account 12-2143 the amount required for a three-month extension of time for filing a response to the Office Action. Reconsideration and withdrawal of the claim rejections and allowance of the amended claims are respectfully requested.

Respectfully submitted,

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CERTIFICATE OF MAILING per 37 CFR 1.8(a)

The person signing below hereby certifies that this paper (along with any paper referred to as being attached or enclosed) is being deposited on the date indicated below with the United States Postal Service in an envelope addressed to the Assistant Commissioner of Patents, Washington, DC 20231, with sufficient postage as first class mail (37 CFR 1.8(a)) on Nov. 20, 2003.

Printed name: Miles B. Dearth

Signature

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Current Set of Claims:

1 – 53 (Previously Cancelled)

54. (Previously Amended) A method according to claim 99 wherein the coating is formed directly on the substrate surface.

55. (Previously Cancelled)

56. (Previously Amended) A method according to claim 99 wherein the substrate comprises a substantially cured elastomeric material.

57. (Original) A method according to claim 56 wherein the elastomeric material is a thermoplastic elastomer.

58. (Previously Cancelled)

59. (Previously Amended) A method according to claim 99 wherein step (a) occurs at room temperature.

60. (Previously Amended) A method according to claim 99 wherein step (a) comprises applying a catalyst onto the substrate surface.

61. (Original) A method according to claim 60 wherein the catalyst is dissolved or mixed into a liquid carrier fluid.

62. (Original) A method according to claim 60 wherein the catalyst is included as a component in a multi-component composition.

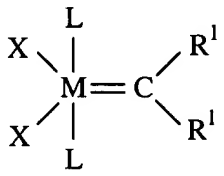
63. (Previously Amended) A method according to claim 99 wherein the catalyst is included as a component of the substrate resulting from mixing said catalyst in bulk with the material forming said substrate.

64. (Original) A method according to claim 56 wherein the elastomeric material is selected from natural rubber, polychloroprene, polybutadiene, polyisoprene, styrene-butadiene copolymer rubber, acrylonitrile-butadiene copolymer rubber, ethylene-propylene copolymer rubber, ethylene-propylene-diene terpolymer rubber, butyl rubber, brominated butyl rubber, alkylated chlorosulfonated polyethylene rubber, hydrogenated nitrile rubber, silicone rubber, fluorosilicone rubber, poly(n-butyl acrylate), thermoplastic elastomer and mixtures thereof.

65. (Previously Amended) A method according to claim 99 wherein the catalyst is selected from at least one of a rhenium compound, ruthenium compound, osmium compound, molybdenum compound, tungsten compound, titanium compound, niobium compound, iridium compound and $MgCl_2$.

66. (Previously Amended) A method according to claim 65 wherein the catalyst is selected from a ruthenium compound, a molybdenum compound, an iridium compound and an osmium compound.

67. (Original) A method according to claim 66 wherein the catalyst has a structure represented by



wherein M is Os, Ru or Ir; each R^1 is the same or different and is H, alkenyl, alkynyl, alkyl, aryl, alkaryl, aralkyl, carboxylate, alkoxy, alkenylalkoxy, alkenylaryl, alkynylalkoxy, aryloxy, alkoxycarbonyl, alkylthio, alkylsulfonyl or alkylsulfinyl; X is the same or different and is an anionic ligand group; and L is

the same or different and is a neutral electron donor group.

68. (Original) A method according to claim 67 wherein X is Cl, Br, I, F, CN, SCN, or N_3; L is $Q(R^2)_a$ wherein Q is P, As, Sb or N; R^2 is H, cycloalkyl, alkyl, aryl, alkoxy, arylate or a heterocyclic ring; and a is 1, 2 or 3; M is Ru; and R^1 is H, phenyl, -CH=C(phenyl)$_2$, -CH=C$(CH_3)_2$ or -C$(CH_3)_2$(phenyl).

69. (Original) A method according to claim 68 wherein the catalyst is a phosphine-substituted ruthenium carbene.

70. (Original) A method according to claim 69 wherein the catalyst is bis(tricyclohexylphosphine)benzylidene ruthenium (IV) dichloride.

71. (Previously Amended) A method according to claim 99 wherein the catalyst is stable in the presence of moisture and oxygen and can initiate polymerization of the metathesizable material upon contact at room temperature.

72. (Previously Amended) A method according to claim 99 wherein the metathesizable material includes at least one reactive unsaturated functional group.

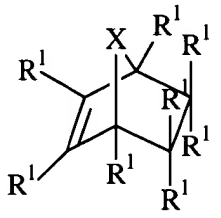
73. (Original) A method according to claim 72 wherein the metathesizable material comprises an olefin.

74. (Original) A method according to claim 72 wherein the metathesizable material is selected from ethene, α-alkene, acyclic alkene, acyclic diene, acetylene, cyclic alkene and cyclic polyene and mixtures thereof.

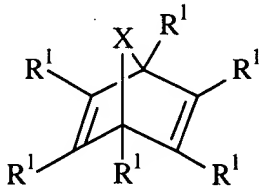
75. (Previously Amended) A method according to claim 99 wherein the metathesizable material comprises a cycloolefin.

76. (Original) A method according to claim 75 wherein the metathesizable material is a monomer or oligomer selected from norbornene, cycloalkene, cycloalkadiene, cycloalkatriene, cycloalkatetraene, aromatic-containing cycloolefin and mixtures thereof.

77. (Original) A method according to claim 76 wherein the metathesizable material comprises a norbornene having a structure represented by



or



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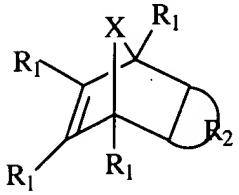
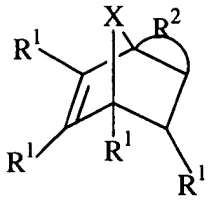


or



wherein X is CH_2, CHR^3, $C(R^3)_2$, O, S, N-R^3, P-R^3, O=P-R^3, $Si(R^3)_2$, B-R^3 or As-R^3; each R^1 is independently H, CH_2, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl, halogen, halogenated alkyl, halogenated alkenyl, alkoxy, oxyalkyl, carboxyl, carbonyl, amido, (meth)acrylate-containing group, anhydride-containing group, thioalkoxy, sulfoxide, nitro, hydroxy, keto, carbamato, sulfonyl, sulfinyl, carboxylate, silanyl, cyano or imido; R^2 is a fused aromatic, aliphatic or heterocyclic or polycyclic ring; and R^3 is alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl or alkoxy.

78. (Original) A method according to claim 77 wherein the metathesizable material comprises ethylidenenorbornene monomer or oligomer.

79. (Previously Amended) A method according to claim 99 wherein the metathesizable material is in the form of a liquid.

80. (Previously Amended) A method according to claim 99 wherein the metathesizable material is a component of a multi-component composition.

81. (Previously Amended) A method according to claim 99 wherein the catalyst is applied in the form of an aqueous solution or mixture and the metathesizable material is applied in the form of a liquid that is substantially 100 percent reactive.

82. (Previously Amended) A method according to claim 99 wherein the method is substantially free of the use of volatile organic solvents.

83. (Previously Amended) A method according to claim 99 wherein step (a) comprises applying a ruthenium catalyst in a liquid carrier to the substrate surface and step (b) comprises applying a metathesizable liquid norbornene monomer to the catalyst-applied substrate surface.

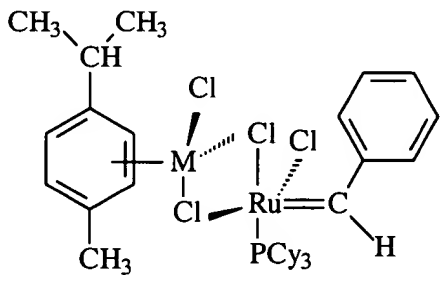
84-92 (previously cancelled)

93. (Previously Amended) A method according to claim 99 wherein step (b) further comprises contacting the substrate surface multiple times with the same or different metathesizable material, allowing a metathesis product to be formed each said time as a coating from contacting active sites on the product surface.

94. (Original) A method according to claim 93 wherein an active amount of catalyst remains on the substrate surface after each successive coating sufficient to polymerize the subsequent application of the metathesizable material.

95. (previously cancelled)

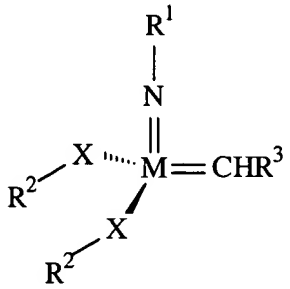
96. (Original) A method according to claim 66 wherein the catalyst comprises a bimetallic catalyst having a structure represented by



wherein M is Ru, Os or Rh. wherein M is Mo or W; X is O or S; R^1 is an alkyl, aryl, aralkyl, alkaryl, haloalkyl, haloaryl, haloaralkyl, or a silicon-containing analog thereof; R^2 are each individually the same or different and are an alkyl, aryl, aralkyl, alkaryl, haloalkyl, haloaryl, haloaralkyl, or together form a heterocyclic or cycloalkyl ring; and R^3 is alkyl, aryl, aralkyl or alkaryl.

97. (Previously cancelled)

98. (Original) A method according to claim 66 wherein the catalyst has a structure represented by



wherein M is Mo or W; X is O or S; R^1 is an alkyl, aryl, aralkyl, alkaryl, haloalkyl, haloaryl, haloaralkyl, or a silicon-containing analog thereof; R^2 are each individually the same or different and are an alkyl, aryl, aralkyl, alkaryl, haloalkyl, haloaryl, haloaralkyl, or together form a heterocyclic or cycloalkyl ring; and R^3 is alkyl, aryl, aralkyl or alkaryl.

99. (Currently Amended) A method for providing a coating on a ~~non-fibrous~~ metal substrate surface comprising: (a) providing a metathesis catalyst at the metal substrate surface; and subsequently (b) contacting said catalyst on the metal substrate surface with a coating by printing, spraying, dipping, brushing, wiping, or roll coating of a material that undergoes a metathesis reaction, and (c) forming a coating on said substrate surface from the product of said metathesis reaction.

100. (Previously Presented) The method of claim 99 wherein said metathesizable material is a component of a paint.

101. (Previously Presented) The method of claim 99 wherein said contacting of said catalyst is by printing wherein said printing is on predetermined selected areas on said substrate.

102. (Previously Presented) The method of claim 99 wherein said catalyst is spray-applied, and said metathesizable material is spray-applied.

103. (Previously Cancelled)

104. (Currently Amended) A method for providing a coating on the outermost portion of a ~~non-fibrous~~ metal substrate, said coating is uniform, conforming to the ~~outermost~~ surface of said metal substrate, said method comprising:

(a) providing a metathesis catalyst at the metal substrate surface; and subsequently

(b) contacting the catalyst on the metal substrate surface with a material that undergoes a metathesis reaction to form a coating of the product of said metathesis reaction on said metal substrate.

105. (Previously Presented) A method according to claim 104 wherein the coating is formed directly on the substrate surface.

106. (Previously Presented) A method according to claim 99 wherein the coating has a thickness that is less than the thickness of the substrate.

107. (Previously Presented) A method according to claim 104 wherein the coating has a thickness that is less than the thickness of the substrate.

108. (Canceled)

109. (Canceled)

110. (Previously Presented) A method according to claim 104 wherein step (b) occurs at room temperature.

111. (Previously Presented) A method according to claim 104 wherein steps (a)-(b) occur at room temperature.

112. (Previously Presented) A method according to claim 104 wherein step (a) comprises applying a catalyst onto the substrate surface.

113. (Previously Presented) A method according to claim 112 wherein the catalyst is dissolved or mixed into a liquid carrier fluid.

114. (Previously Presented) A method according to claim 112 wherein the catalyst is included as a component in a multi-component composition.

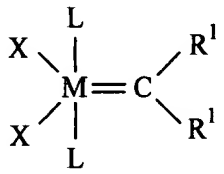
115. (Previously Presented) A method according to claim 104 wherein the catalyst is included as a component of the substrate resulting from mixing said catalyst in bulk with the material forming said substrate.

116. (Canceled)

117. (Previously Presented) A method according to claim 104 wherein the catalyst is selected from at least one of a rhenium compound, ruthenium compound, osmium compound, molybdenum compound, tungsten compound, titanium compound, niobium compound, iridium compound and $MgCl_2$.

118. (Previously Presented) A method according to claim 117 wherein the catalyst is selected from a ruthenium compound, a molybdenum compound, an iridium compound and an osmium compound.

119. (Previously Presented) A method according to claim 118 wherein the catalyst has a structure represented by



wherein M is Os, Ru or Ir; each R^1 is the same or different and is H, alkenyl, alkynyl, alkyl, aryl, alkaryl, aralkyl, carboxylate, alkoxy, alkenylalkoxy, alkenylaryl, alkynylalkoxy, aryloxy, alkoxycarbonyl, alkylthio, alkylsulfonyl or alkylsulfinyl; X is the same or different and is an anionic ligand group; and L is the same or different and is a neutral electron donor group.

120. (Previously Presented) A method according to claim 119 wherein X is Cl, Br,

I, F, CN, SCN, or N_3; L is $Q(R^2)_a$ wherein Q is P, As, Sb or N; R^2 is H, cycloalkyl, alkyl, aryl, alkoxy, arylate or a heterocyclic ring; and a is 1, 2 or 3; M is Ru; and R^1 is H, phenyl, -CH=C(phenyl)$_2$, -CH=C$(CH_3)_2$ or -C$(CH_3)_2$(phenyl).

121. (Previously Presented) A method according to claim 120 wherein the catalyst is a phosphine-substituted ruthenium carbene.

122. (Previously Presented) A method according to claim 121 wherein the catalyst is bis(tricyclohexylphosphine)benzylidene ruthenium (IV) dichloride.

123. (Previously Presented) A method according to claim 104 wherein the catalyst is stable in the presence of moisture and oxygen and can initiate polymerization of the metathesizable material upon contact at room temperature.

124. (Previously Presented) A method according to claim 107 wherein the metathesizable material includes at least one reactive unsaturated functional group.

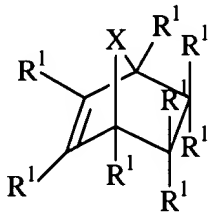
125. (Previously Presented) A method according to claim 124 wherein the metathesizable material comprises an olefin.

126. (Previously Presented) A method according to claim 125 wherein the metathesizable material is selected from ethene, α-alkene, acyclic alkene, acyclic diene, acetylene, cyclic alkene and cyclic polyene and mixtures thereof.

127. (Previously Presented) A method according to claim 104 wherein the metathesizable material comprises a cycloolefin.

128. (Previously Presented) A method according to claim 127 wherein the metathesizable material is a monomer or oligomer selected from norbornene, cycloalkene, cycloalkadiene, cycloalkatriene, cycloalkatetraene, aromatic-containing cycloolefin and mixtures thereof.

129. (Previously Presented) A method according to claim 128 wherein the metathesizable material comprises a norbornene having a structure represented by



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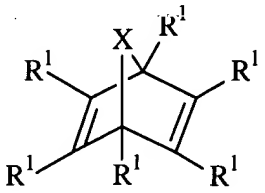

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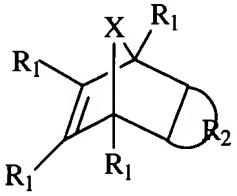

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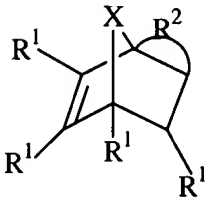


wherein X is CH_2, CHR^3, $C(R^3)_2$, O, S, N-R^3, P-R^3, O=P-R^3, $Si(R^3)_2$, B-R^3 or As-R^3; each R^1 is independently H, CH_2, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl, halogen, halogenated alkyl, halogenated alkenyl, alkoxy, oxyalkyl, carboxyl, carbonyl, amido, (meth)acrylate-containing group, anhydride-containing

group, thioalkoxy, sulfoxide, nitro, hydroxy, keto, carbamato, sulfonyl, sulfinyl, carboxylate, silanyl, cyano or imido; R^2 is a fused aromatic, aliphatic or heterocyclic or polycyclic ring; and R^3 is alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkaryl, aralkyl or alkoxy.

130. (Previously Presented) A method according to claim 129 wherein the metathesizable material comprises ethylidenenorbornene monomer or oligomer.

131. (Previously Presented) A method according to claim 104 wherein the metathesizable material is in the form of a liquid.

132. (Previously Presented) A method according to claim 104 wherein the metathesizable material is a component of a multi-component composition.

133. (Previously Presented) A method according to claim 104 wherein the catalyst is applied in the form of an aqueous solution or mixture and the metathesizable material is applied in the form of a liquid that is substantially 100 percent reactive.

134. (Previously Presented) A method according to claim 104 wherein the method is substantially free of the use of volatile organic solvents.

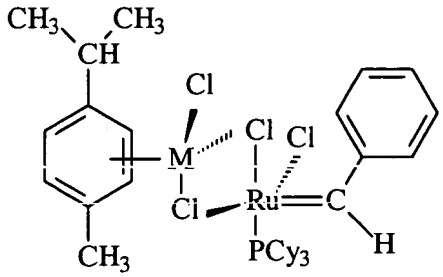
135. (Previously Presented) A method according to claim 104 wherein step (a) comprises applying a ruthenium catalyst in a liquid carrier to the substrate surface and step (b) comprises applying a metathesizable liquid norbornene monomer to the catalyst-applied substrate surface.

136. (Previously Presented) A method according to claim 104 wherein step (b) further comprises contacting the substrate surface multiple times with the same or different metathesizable material, allowing a metathesis reaction to form a polymerized product each said time, resulting in a multi-layered coating.

137. (Previously Presented) A method according to claim 136 wherein an active

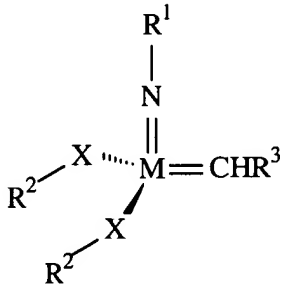
amount of catalyst remains on the substrate surface after each successive coating sufficient to polymerize the subsequent application of the metathesizable material.

138. (Previously Presented) method according to claim 118 wherein the catalyst comprises a bimetallic catalyst having a structure represented by



wherein M is Ru, Os or Rh.

139. (Previously Presented) A method according to claim 118 wherein the catalyst has a structure represented by



wherein M is Mo or W; X is O or S; R^1 is an alkyl, aryl, aralkyl, alkaryl, haloalkyl, haloaryl, haloaralkyl, or a silicon-containing analog thereof; R^2 are each individually the same or different and are an alkyl, aryl, aralkyl, alkaryl, haloalkyl, haloaryl, haloaralkyl, or together form a heterocyclic or cycloalkyl ring; and R^3 is alkyl, aryl, aralkyl or alkaryl.

140. (Previously Presented) The method of claim 104 wherein said metathesizable material is a component of a paint.

141. (Previously Presented) The method of claim 104 wherein said contacting of said catalyst is by printing wherein said printing is on predetermined selected areas on said substrate.

142. (Previously Presented) The method of claim 104 wherein said catalyst is spray-applied, and said metathesizable material is spray-applied.

143. (previously canceled)

144. (Currently amended) The method of claim 99 wherein said metal substrate is selected from the group consisting of a metal, machined metal part, ~~machined elastomer part, molded elastomer article, molded engineering thermoplastic article, extruded fiber, extruded thermoplastic, extruded thermoset,~~ sheet metal, and metal coil, ~~fiberglass, wood, paper, ceramic, and glass~~.

145. (Currently amended) The method of claim 144 wherein said metal substrate ~~is a metal substrate comprising~~ comprises a metal selected from the group consisting of iron, steel, lead, copper, aluminum, brass, bronze, monel, nickel, zinc, tin, gold, silver, and platinum.

146. (Previously Presented) The method of claim 99 wherein said substrate is a material selected from the group consisting of fiber-glass reinforced prepreg, and sheet molding compound.

147. (Canceled)

148. (Currently Amended) The method of claim ~~147 wherein said substrate is a metal substrate comprising~~ 104 wherein said metal substrate comprises a metal selected from the group consisting of iron, steel, lead, copper, aluminum, brass, bronze, monel, nickel, zinc, tin, gold, silver, and platinum.

149. (Canceled)

150. (Previously Presented) A method according to claim 104 wherein the coating has a thickness that is less than the thickness of the substrate.

151. (Canceled)

152. (Canceled)

153. (Currently amended) The method according to claim 99 wherein the ~~non-fibrous~~ metal substrate comprises a metallic material.

154. (Previously Presented) The method according to claim 153 wherein metallic material comprises a material selected the group consisting of iron, stainless steel, electrogalvanized steel, lead, aluminum, copper, brass, bronze, MONEL metal alloy, nickel, zinc, tin, gold, silver, platinum, and palladium.

155. (Previously Presented) The method according to claim 154 wherein the metallic material comprises steel.

156. (Canceled)

157. (Canceled)

158. (Previously Presented) The method according to claim 153 wherein the metallic material is previously treated prior to coating by a method selected from the group consisting of degreasing, grit-blasting, converting, phosphatizing, electrodepositing, and autodepositing.

159. (Currently amended) The method according to claim 99 wherein said ~~non-fibrous~~ metal substrate is a machined part made from metal and elastomer.

160. (Currently amended) The method according to claim 99 wherein said ~~non-fibrous~~ substrate is an article made from a material selected from the group consisting of ~~thermoplastic, thermoset,~~ sheet metal, and coil metal, ~~fiberglass, wood, paper, ceramics, and glass~~.

161. (Canceled)

162. (Canceled)

163. (Canceled)

164. (Currently amended) The method according to claim 104 wherein the ~~non-fibrous~~ metal substrate comprises a metallic material.

165. (Previously Presented) The method according to claim 164 wherein metallic material comprises a material selected the group consisting of iron, stainless steel, electrogalvanized steel, lead, aluminum, copper, brass, bronze, MONEL metal alloy, nickel, zinc, tin, gold, silver, platinum, and palladium.

166. (Previously Presented) The method according to claim 165 wherein the metallic material comprises steel.

167. (Canceled)

168. (Canceled)

169. (Previously Presented) The method according to claim 164 wherein the metallic material is previously treated prior to coating by a method selected from the group consisting of degreasing, grit-blasting, converting, phosphatizing, electrodepositing, and autodepositing.

170. (Currently amended) The method according to claim 104 wherein said ~~non-fibrous~~ metal substrate is a machined part made from metal and elastomer.

171. (Currently Amended) The method according to claim 104 wherein said non-fibrous substrate is an article made from a material selected from the group consisting of ~~thermoplastic, thermoset,~~ sheet metal, and coil metal, ~~fiberglass, wood, paper, ceramics, and glass~~.

172. (Canceled)